



## IP68 Hood and Housing Series

### 1. INTRODUCTION

#### 1.1 Purpose

This document provides the qualification test summary of TE Connectivity IP68 hoods and housings of HDC connector.

#### 1.2 Scope

This specification covers the electrical, mechanical, and environmental performance of IP68 HBPR opposite angle locking hoods and housings (housing: bulkhead mounted or surface mounted type) and HBPR central locking hoods and housings (housing: bulkhead mounted or surface mounted type) and HBPR panel mounted hood and HBPR panel installing hood.

#### 1.3 Conclusion

Based on the test results, all meet the requirements according to TE Connectivity Design Objectives 108-137014.

#### 1.4 Product Description

Name	Remarks
HBPR-TSH/TGH-PG/M	HBPR opposite angle locking hood
HBPR-AG/ HBPR-AG-4S	HBPR opposite angle locking housing (bulkhead mounted)
HBPR-SGRH-PG/M	HBPR opposite angle locking housing (surface mounted)
HBPR-TSHC/TGHC- PG/M	HBPR central locking hood
HBPR-SGRHC- PG/M	HBPR central locking housing (surface mounted)
HBPR-AGC/AGCT	HBPR central locking housing (bulkhead mounted)
HBPR-TSA/TGA-PG/M	HBPR panel mounted hood
HBPR-TGMA-GR- PG/M	HBPR panel installing hood

## 1.5 Qualification Test Sequence

Test or Examination	Test Group					
	A	B	C	D	E	F
	Test Sequence <sup>1)</sup>					
Visual and dimensional examination	1,3	1,6	1,6	1,4	1,3	1,3
Mechanical strength impact	2					
Vibration				2		
Shock				3		
Cold		3	3			
Dry Heat		4	4			
Salt Spray Test					2	
Degree of protection IP6X		2,5				
Degree of protection IPX8			2,5			
Degree of protection IPX9K						2

### \*Notes:

1) Numbers indicate the sequence in which the tests are performed.

## 2. TEST PROCEDURE

General			
No.	Test Items	Requirements	Condition according to
2.1	Visual and dimensional examination	Meets requirements of product drawing	Visual and dimensional examination IEC 60512-1-1/-2, Test 1a and 1b
Mechanical			
2.2	Mechanical strength impact	No damage likely to impair function	Dropping height: - 750mm for specimens of mass $\leq$ 250g - 500mm for specimens of mass > 250g Dropping cycles: 8 positions in 45° step, one cycles per position IEC 60512-7-2 Test 7b
2.3	Vibration, Random	No damage likely to impair function No discontinuities greater than $t > 1\mu s$	Frequency: 5~150Hz Per EN 61373, Category 1, Class B (IEC 60068-2-6 Test Fc)
2.4	Shock	No damage likely to impair function No discontinuities greater than $t > 1\mu s$	Acceleration: 50m/s <sup>2</sup> Duration: 30ms Total 18 shocks (three positive and three negative in each of the three orthogonal axes) Per EN 61373

Environmental			
2.5	Cold	No damage likely to impair function	Subject mated specimen to -40℃ Duration time: 16h, Test Ab Per IEC 60512-11-10 Test 11j (IEC 60068-2-1)
2.6	Dry Heat	No damage likely to impair function	Subject mated specimen to +125℃ Duration time: 168h Test Bb Per IEC 60512-11-9 Test 11i (IEC 60068-2-2)
2.7	Salt Spray Test	No damage likely to impair function	Follow: ASTM B117-11 Test Condition: 1). Mated connector 2). Salt spray: $(5 \pm 1) \% NaCl$ (m/m) concentration solution; 3). Temperature $(35 \pm 1) ^\circ C$ 4). Precipitation rate of salt spray (1.0-2.0) ml / 80cm <sup>2</sup> h 5). PH value: 6.5-7.2 6). Duration: 72H

Protection			
2.8	Degree of protection IP6X	No ingress of dust	Test IP 6X according to IEC 60529
2.9	Degree of protection IPX8	No ingress of water	Test IP X8 according to IEC 60529 Water immersion: 1m, 24Hours, No water immerge. 7.3.6.3&7.3.7of EN61984
2.10	Degree of protection IPX9K	No ingress of water	Test IP X9K according to DIN 40050-9 No water immerge. 7.3.6.3&7.3.7of EN61984

## 3. SUMMARY OF TEST RESULTS:

### Examination of product – all test group

Test Group	Test Item	Test Result	Requirement	Judgment
Group A	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Mechanical strength impact	No physical damage	No damage likely to impair function	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
Group B	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Degree of protection IP6X	No ingress of dust	No ingress of dust	passed
	Cold	No damage likely to impair function	No damage likely to impair function	passed
	Dry Heat	No damage likely to impair function	No damage likely to impair function	passed
	Degree of protection IP6X	No ingress of dust	No ingress of dust	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
Group C	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Degree of protection IPX8	No ingress of water	No ingress of water	passed
	Cold	No damage likely to impair function	No damage likely to impair function	passed
	Dry Heat	No damage likely to impair function	No damage likely to impair function	passed
	Degree of protection IPX8	No ingress of water	No ingress of water	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed

Group D	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Vibration	No breakdown or flashover	No damage likely to impair function No discontinuities greater than $t > 1\mu s$	passed
	Shock	No breakdown or flashover	No damage likely to impair function No discontinuities greater than $t > 1\mu s$	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
Group E	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Salt Mist Cyclic Test	No physical damage	No damage likely to impair function	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
Group F	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed
	Degree of protection IPX9K	No ingress of water	No ingress of water	passed
	Visual and dimensional examination	No physical damage	Meets requirements of product drawing	passed